Responsive Open Learning Environments at the Open University

Conference or Workshop Item

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Abstract: Personal Learning Environments (PLEs) offer new opportunities for supporting personalized and self-regulated learning both in formal and in informal education. The Open University in the UK is an early adopter of PLEs through a number of different initiatives, one of which is the European project ROLE (Responsive Open Learning Environments). This paper presents some of the lessons learned and best practices from the introduction of ROLE technologies within an informal learning test-bed at the Open University.

Introduction

The Personal Learning Environment (PLE) is a facility for an individual to access, aggregate, configure and manipulate digital artefacts of their ongoing learning experiences. As opposed to a Learning Management System (LMS), the PLE follows a learner-centric approach, allowing the use of lightweight services and tools that belong to and are controlled by individual learners. Rather than integrating different services into a centralised system, the PLE provides the learner with a variety of services and hands over control to her to select and use these services the way she deems fit (Chatti *et al.*, 2007, Fiedler and Väljataga, 2010, Wilson, 2008).

The emergence of the PLE has greatly facilitated the use and sharing of open and reusable learning resources online. Learners can access, download, remix, and republish a wide variety of learning materials through open services provided on the cloud. Open Educational Resources (OER) can be described as "teaching, learning and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use or repurposing by others depending on which Creative Commons license is used" (Atkins *et al.*, 2007).

Self-Regulated Learning (SRL) comprises an essential aspect of the PLE, as it enables learners to become "metacognitively, motivationally, and behaviourally active participants in their own learning process" (Zimmerman, 1989). Although the psycho-pedagogical theories around SRL predate very much the advent of the PLE, SRL is a core characteristic of the latter. SRL is enabled within the PLE through the assembly of independent resources in a way that fulfils a specific learning goal. By following this paradigm, the PLE allows learners to regulate their own learning, thus greatly enhancing their learning outcomes (Steffens, 2006, Fruhmann *et al.*, 2010).

The European research project ROLE (Responsive Open Learning Environments - www.role-project.eu) is aiming at empowering learners for lifelong and self-regulated learning PLEs. In order to study and evaluate the applications of PLEs within a variety of learning contexts, the ROLE project has setup a number of test-beds. The Open University in the UK is one of these test-beds, concerning the learners' potential transition from formal to informal learning. This transition is being implemented within this test-bed as a transition from the traditional LMS towards the paradigm of the PLE (Mikroyannidis, 2011b, Mikroyannidis, 2011a, Mikroyannidis *et al.*, 2010a, Mikroyannidis *et al.*, 2010b, Mikroyannidis and Connolly, 2012). The test-bed in question is OpenLearn (http://openlearn.open.ac.uk), a repository of OER offered by the Open University. This paper presents the lessons learned and the best practices from this transition.

The OpenLearn Test-Bed

OpenLearn currently offers more than 6,000 hours of study materials in a variety of formats. These include materials repurposed as OER from original OU courses i.e. formal delivery as well as bespoke OER created by both OpenLearn academics and non-OU educators, i.e. enabling informal delivery.

OpenLearn users are primarily informal learners, who want to find and study OER either individually or in collaboration with others. These learners can be in formal education e.g. taking an accredited University course elsewhere and simply looking for additional materials to add value to their primary course or they maybe, what is often described as, "leisure" learners i.e. those who simply want to learn for themselves with no expectation of formal accreditation.

OpenLearn currently uses Moodle as a LMS platform. Therefore, in order to add value to those potential learning experiences, this test-bed has endeavoured to raise awareness of PLEs with both the OpenLearn project team as well as with selected parts of the wider OpenLearn community. The OpenLearn test-bed is measuring some of the expectations, perceived benefits and difficulties of implementing a PLE in this environment. Thus, in effect, enabling the assessment of the overall aim by measuring the transition from formal to informal learning as witnessed through OpenLearn staff and students.

This transition attempts to transform and improve the OpenLearn user's experience by enabling individuals to build and personalize their learning environment thus gaining more control over the potential manipulation and production of as well as use of OER study materials. In addition, the adoption of certain ROLE widgets inside study units of the OpenLearn Moodle platform is offering further value to those users by supporting a stronger framework to foster particular communities. This presents an opportunity to individual informal learners to be part of a shared learning experience instead of their current potential lone study.

OpenLearn is a pioneering initiative in the production and dissemination of OER, both within the UK and worldwide. In the context of the ROLE project, we are therefore drawing upon two significant factors that OpenLearn has brought to the OER field: scale and experience (Lane, 2006). Scale in terms of the quality of archive material available that can be repurposed in varying degrees for online dissemination, and also in terms of developing robust systems, both technological and pedagogical, which provide a meaningful learning experience to large student populations. Experience in terms of producing distance education material that is designed to be studied by informal learners, who often have competing demands on their time, and a range of needs and experience.

By drawing upon these factors, we are reaching out to a global audience of informal learners, in order to raise awareness about PLEs through specialised OER. These OER introduce the core concepts behind ROLE and PLEs and allow the use of ROLE tools with guidance from structured learning activities. The ROLE OER are available as free study units in OpenLearn and can be downloaded, remixed and republished. The people who study these units are also encouraged to provide their feedback and suggestions about the ROLE tools and PLEs in general.

More specifically, the following ROLE OER are currently available as study units in OpenLearn:

- *Responsive Open Learning Environments* (http://labspace.open.ac.uk/course/view.php?id=7433): This course provides an overview of the concepts behind PLEs and also demonstrates a selection of learning tools that have been developed by ROLE.
- *Self Regulated Learning* (http://labspace.open.ac.uk/course/view.php?id=7898): This course introduces the concept of SRL and guides learners into using the ROLE tools in order to apply the SRL principles into their own learning.

User evaluations

Qualitative and quantitative data were collected through a number of different research instruments. Introductory workshops have been organised presenting the basic scenario of a PLE to the audience, followed by an opportunity to experience using pre-selected ROLE tools implemented into a dedicated OpenLearn study unit. A number of workshops have been conducted using ROLE tools with different groups, i.e. learners and educators. The outcomes of the workshops conducted in 2011 are reported in (Mikroyannidis and Connolly, 2012).

In January 2012, a workshop attended by 20 educators took place at the Open University, Milton Keynes, UK. It was organised in conjunction with the eLearning Community (eLC) of the Open University. The workshop was part of a monthly showcase event demonstrating a wide range of both research and implementations of current eLearning applications. A second workshop took place at the Joint European Summer School on Technology Enhanced Learning (JTEL) in Estoril, Portugal, in May 2012. Participants were 14 postgraduate students from universities across Europe. The JTEL Summer School is an annual event and

offers an opportunity for PhD students, in different subject areas, in TEL to meet, exchange knowledge and develop their research skills whilst engaging with the active TEL community of practice.

In both workshops, participants were introduced to the ROLE project through a presentation and a structured activity opportunity. The activity was divided in two parts: during the first part, participants had the chance to try the selection of ROLE widgets shown in Figure 1. Participants were asked to use the two pre-selected ROLE search widgets called Binocs and ObjectSpot in order to find OER that would be suitable to support them in their respective research or teaching scenarios. A third widget, called EtherPad, was also available for this activity and it enabled participants to share their findings in a collective electronic notepad format. In the second part of the activity, participants used the ROLE mash-up recommender widget (see Figure 2) in order to start building their own PLE. Based on the recommendations provided by this widget, participants were able to build their widget mash-ups in iGoogle (www.google.com/ig).

At the end of each workshop, a group discussion was held with the participants contributing about their experiences of using the ROLE tools. Additionally, participants were asked to answer a short online questionnaire (see http://fit-bscw.fit.fraunhofer.de/pub/bscw.cgi/39571021). The purpose of this questionnaire was to gather user feedback both specifically about the ROLE widgets, as well as more generally about the perceived usefulness and ease of use of PLEs, via questions based on the Technology Acceptance Model (TAM) (Fishbein and Ajzen, 1975, Venkatesh and Davis, 2000, Venkatesh and Bala, 2008).

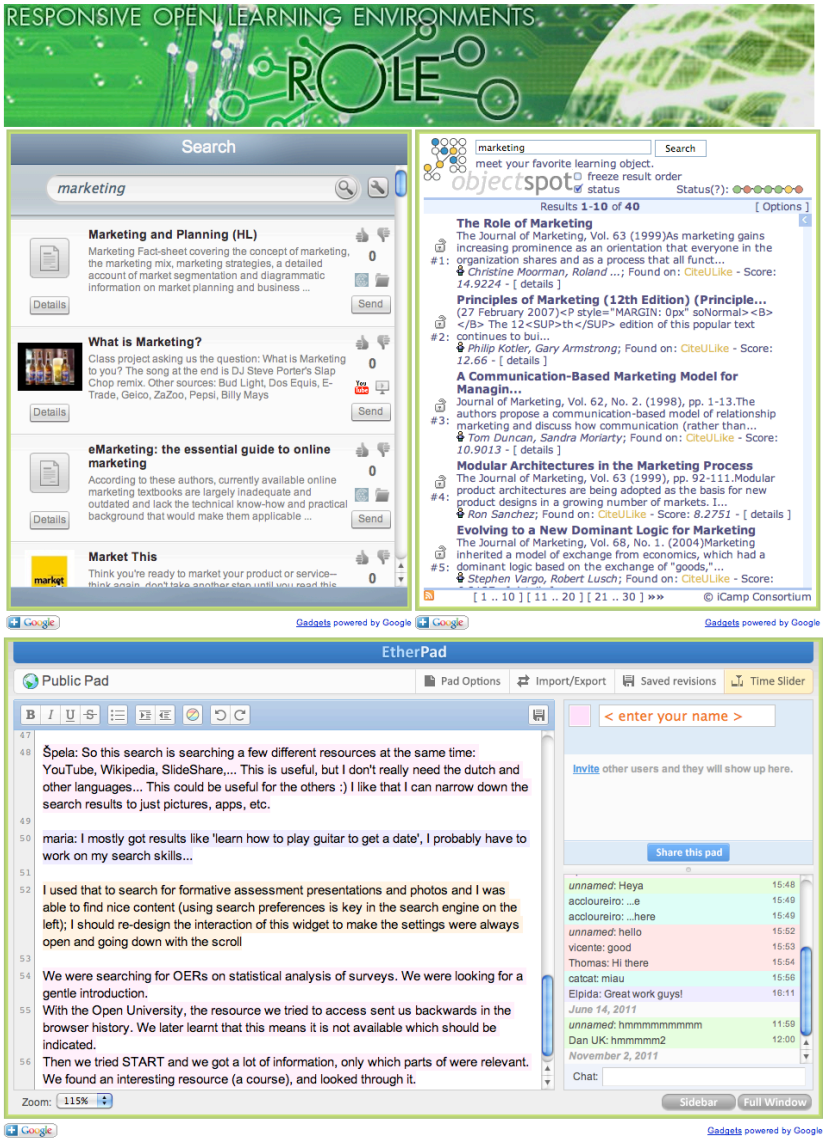

Figure 1: The ROLE widgets used for finding and sharing OER.

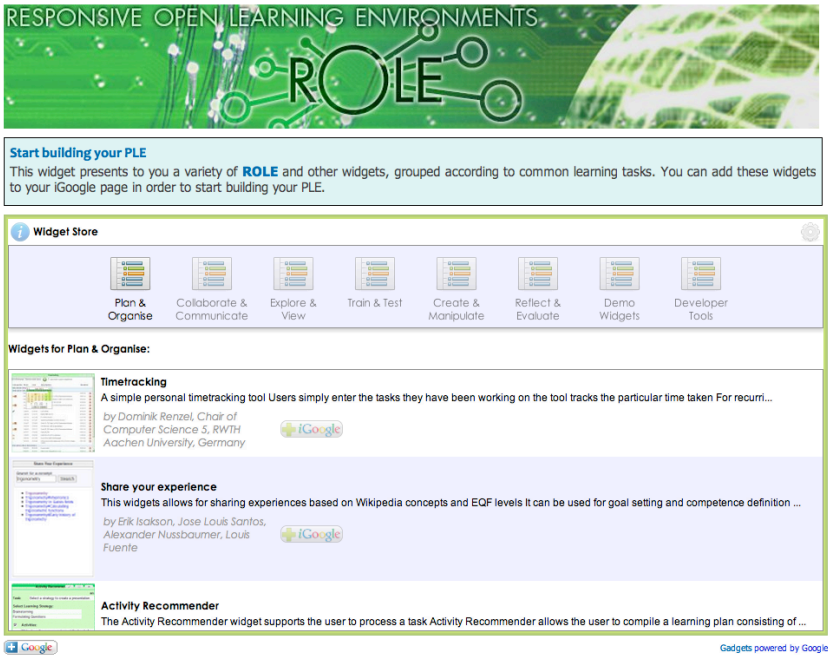

Figure 2: The ROLE mash-up recommender provides recommendations for building a widget mash-up.

The results of both workshops were recorded in a number of formats. Quantitative data was primarily collected from the questionnaire, whilst the majority of the qualitative data was collected in situ when facilitators circulated amongst the participants. The questionnaire also contained a number of semi-structured questions permitting free text individual responses. Supplementary qualitative data was gathered electronically via the EtherPad widget.

In the first workshop, which was attended by educators, there was an even gender split amongst participants who completed the survey and an indication that the majority of attendees were over 40 years old. This was not an unusual composition for an eLC group as many people who attend these regular events are generally experienced teachers, skilled researchers or significantly qualified learning technologists. The common denominator amongst them being an active interest in eLearning advances as well as hearing first-hand about new and innovative eLearning applications and experiences gained from their fellow colleagues.

With this in mind, those who completed the ROLE survey (about 50% of all participants) declared themselves to have an even split of knowledge in relation to Technology-Enhanced Learning (TEL). Conversely, however, a significant 88% of those participants felt that they had "some" rather than a "good" knowledge of Personal Learning Environments (PLEs). In other words it appeared that the group as a whole were relatively new to the idea of PLEs.

There was a rather mixed response to the set of questions about the perceived usefulness and ease of use of PLEs. There was a 77% agreement that PLEs would be slightly useful for participants work followed by a slight disagreement that the same PLEs would help participants accomplish their work more effectively than their current use of learning technology. Again this was not surprising as most group members were established and experienced users of learning technology and had revealed that they only had limited use of PLEs.

Half the group proffered a neutral response to the statement relating to "It would be easy for me to use a PLE" whilst the remainder recorded that there was a slight chance that that would be the case. There was a more even spread of responses to the statement "It would be clear to me how to assemble a PLE using widgets" ranging from slight disagreement (11%) through to slight agreement (also 11%). Most participants remained neutral on the subject.

Interestingly, the statement "I would find using a PLE frustrating" invited the most disagreement to be recorded with the majority (55%) remaining neutral alongside 33% saying they slightly disagreed and 11% strongly disagreeing. Once again the following statement of "I would find interacting with a PLE requires a lot of mental effort" statement invited a strong neutrality (55%) yet 22% of participants strongly disagreed with this premise whilst 11% recorded that they slightly agreed that this would be the case fro them. The remaining part

of the survey related to participants motivation to using a PLE in their learning process whereby 55% remained neutral in their responses and 44% slightly agreeing with this statement. The last statement of "I predict that I would frequently use a PLE if I had access to it" invited an even response (33%) between slightly disagreeing through neutral to slightly agreeing.

The second workshop had an even gender split between participants too. The participating students were younger than the educators of the first workshop, all of them being under 40 years old. Similarly to the first group, the majority of the students indicated that they have a "good" knowledge of TEL, but only "some" knowledge of PLEs.

Regarding the perceived usefulness and ease of use of PLEs, the majority of the students (83%) agreed that a PLE would be useful for their work. However, only 50% agreed that they would accomplish their work more effectively with a PLE. Also, only 50% said they would find using a PLE easy. There was an almost even distribution of responses from strong disagreement to strong agreement to the statements "It would be clear to me how to assemble a PLE using widgets" and "I would find using a PLE frustrating". The majority (83%) were neutral to the statement "I would find interacting with a PLE requires a lot of my mental effort" and only 16% strongly disagreed to it. There was no disagreement to the statement "Using a PLE would improve my motivation for learning". Finally, the statement "I predict that I would frequently use a PLE if I had access to it" invited a 33% strong agreement and a 66% neutral response.

The qualitative feedback received in both events was quite positive and constructive. The educators identified the opportunities and challenges in providing such a learning environment to their students (*"The possibilities are huge. One challenge will be to encourage learners to take ownership of the PLE, especially if they first meet it via a VLE"*). Most students also found the ROLE widgets they interacted with quite useful for their research and learning *("Small apps which can expand your daily routine"*).

The overall feedback received so far from user evaluations in the context of the OpenLearn test-bed, suggests that learners and educators are looking for accessible and easy to use learning tools, accompanied with introductory and guidance learning course materials. These tools need to be easily customizable so that they can fit the needs and goals of individuals. Learners want to be able to receive feedback about their learning progress, as well as provide feedback about the usefulness of the tools and their overall learning experience. Finally, supporting and motivating SRL through appropriate tools and services, such as recommenders, is quite critical for the successful adoption of PLEs.

Conclusion and Further Work

The successful implementation and adoption of PLEs involve significant challenges, as shown by the OpenLearn test-bed at the Open University. These challenges are mainly related with the different levels of support required by the target audiences, as well as the overall quality of the offered educational tools and services. The authors plan to continue evaluating the usefulness of PLEs within a variety of learning contexts and scenarios, throughout the lifetime of the ROLE project. These evaluations will offer a further insight into the potential of PLEs in education, as well as a better understanding of the needs of various communities of learners and educators.

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References

Atkins, D. E., Brown, J. S. & Hammond, A. L. (2007) A Review of the Open Educational Resources (OER) Movement: Achievements, Challenges, and New Opportunities. The William and Flora Hewlett Foundation, http://www.oerderves.org/wp-content/uploads/2007/03/a-review-of-the-open-educational-resources-oer-movement_final.pdf.

Chatti, M. A., Jarke, M. & Frosch-Wilke, D. (2007) The future of e-learning: a shift to knowledge networking and social software. *International Journal of Knowledge and Learning,* 3(4/5), 404-420.

Fiedler, S. & Väljataga, T. (2010) Personal learning environments: concept or technology? *PLE Conference.* Barcelona, Spain http://pleconference.citilab.eu/wp-content/uploads/2010/07/ple2010_submission_45.pdf.

Fishbein, M. & Ajzen, I. (1975) *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*: Addison-Wesley.

Fruhmann, K., Nussbaumer, A. & Albert, D. (2010) A Psycho-Pedagogical Framework for Self-Regulated Learning in a Responsive Open Learning Environment. *International Conference eLearning Baltics Science (eLBa Science 2010).* Rostock, Germany.

Lane, A. (2006) Put on the spot: immediate responses to written questions about Open Educational Resources. *OpenLearn Working paper 3.*The Open University, Milton Keynes. http://kn.open.ac.uk/public/getfile.cfm?documentfileid=11148.

Mikroyannidis, A. (2011a) Evolving e-Learning Ontologies for Personal and Cloud Learning Environments. *7th International Conference on Signal Image Technology & Internet Based Systems (SITIS 2011).* Dijon, France, IEEE Computer Society Publications, 32-37.

Mikroyannidis, A. (2011b) Supporting Self-Regulated Learning within a Personal Learning Environment: The OpenLearn case study. IN KRAVCIK, M., LAW, E. & NUSSBAUMER, A. (Eds.) *International Workshop on Self-Regulated Learning in Responsive Open Learning Environments (SRL-ROLE 2011), 11th IEEE International Conference on Advanced Learning Technologies (ICALT 2011).* Athens, Georgia, USA, IEEE Computer Society Publications.

Mikroyannidis, A. & Connolly, T. (2012) Introducing Personal Learning Environments to Informal Learners: Lessons Learned from the OpenLearn Case Study. *PLE Conference.* Aveiro, Portugal.

Mikroyannidis, A., Lefrere, P. & Scott, P. (2010a) An Architecture for Layering and Integration of Learning Ontologies, applied to Personal Learning Environments and Cloud Learning Environments. *The 10th IEEE International Conference on Advanced Learning Technologies (ICALT 2010).* Sousse, Tunisia, IEEE Computer Society, 92-93.

Mikroyannidis, A., Lefrere, P. & Scott, P. (2010b) A Semantic Knowledge Base for Personal Learning and Cloud Learning Environments. *Workshop on Supporting e-learning with language resources and semantic data, Language Resources and Evaluation Conference (LREC).* Valletta, Malta.

Steffens, K. (2006) Self-Regulated Learning in Technology-Enhanced Learning Environments: lessons of a European peer review. *European Journal of Education,* 41(3/4), 353-379.

Venkatesh, V. & Bala, H. (2008) Technology Acceptance Model 3 and a Research Agenda on Interventions. *Decision Sciences,* 39(2), 273-315.

Venkatesh, V. & Davis, F. D. (2000) A theoretical extension of the technology acceptance model: four longitudinal field studies. *Management Science,* 46(2), 186–204.

Wilson, S. (2008) Patterns of personal learning environments. *Interactive Learning Environments,* 16(1), 17-34.
Zimmerman, B. J. (1989) A Social Cognitive View of Self-Regulated Academic Learning. *Journal of Educational Psychology,* 81(3), 329- 339.